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Hazaribagh.

East long. 85° 20′; North lat. 23° 59′.

	1894. 11^h-1^h.		1894. 11^h-1^h.		1894. 11^h-1^h.		1894. 11^h-1^h.
Jan. 22	9	Jan. 25	0	Jan. 28	0	Jan. 31	0
23	10	26	0	29	0		
24	0	27	0	30	0		

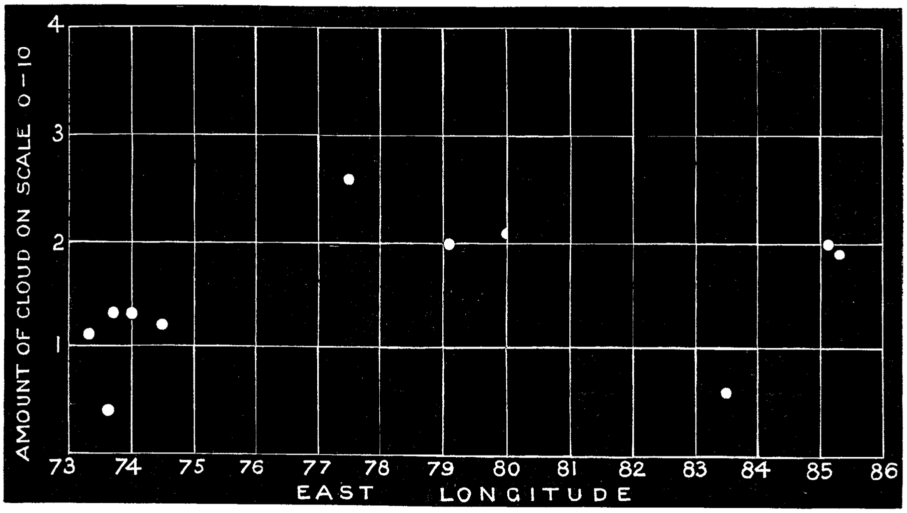
Mean daily amount of cloud 1·9.

Darjeeling.

East long. 88° 18′; North lat. 27° 3′.

	1894. 11^h-1^h.		1894. 11^h-1^h.		1894. 11^h-1^h.		1894. 11^h-1^h.
Jan. 22	5	Jan. 25	3	Jan. 28	9	Jan. 31	10
23	6	26	10	29	10		
24	4	27	10	30	10		

Mean daily amount of cloud 7·7.



Mean amount of cloud in day-time during the latter part of January at stations in India near the path of the moon's shadow on 1898 Jan. 21–22.

Observations taken at Vadsö during the total Eclipse of the Sun, 1896 *August* 9. By Passengers of the S.S. *Neptun* (Norwegian).

(*Drawn up and Communicated by T. C. Porter, Eton College.*)

A. *Direction and Force of Wind.* By E. E. Wilde.

The position taken up was near the edge of the southern cliffs of the island opposite Vadsö, and was about 200 yards E.N.E. of the British Astronomical Association's station; the arrangements, four long pieces of wood laid on the ground pointing N., S., E., and W. respectively, set by the compass *uncorrected for magnetic deviation.* For a flag a very thin piece of old cambric was used, fastened to a crooked stick.

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During most of the eclipse there was not sufficient air to lift it, though it flapped gently. At 4.20 there was sufficient air to keep it fully extended, and at 4.25 it was still stronger, calling for the additional note between the 10^m observations arranged to be noted. By 4.50 it had decreased, and continued doing so till totality. The wind observations were taken more than 100 yards distance from Mr. Weir, who was observing temperature, stationed on the rather lower ground to the north-west.

B. *Atmospheric Temperature.* By Thomas Weir (Manchester).

The thermometer used was a mercurial with a long glass spiral in place of the ordinary bulb, specially made by Casartelli & Son (Manchester), very sensitive to change, and ranging from 20° to 120° Fahrenheit. The scale was read with a magnifying glass.

C. *Colour of Sky, Land, and Sea.*

Four observers * noted these during the progress of the eclipse on sheets of paper having the outlines of the scenery filled in before hand, and on each sheet the landscape colour was written on the corresponding part of the already drawn landscape. Two observers took the view east of the Sun, two that to the west, and each entered the time of beginning and ending each sheet as it was used, the position of the Sun being marked by a large dot on each sheet.

	h m s		h m s
First contact	4 1 6	End of totality	4 58 44
Beginning of totality	4 56 59	Last contact	5 56 42

D. *The Shadow Bands or Striæ.*

Two pairs of observers armed with sticks and sheets watched carefully for these; but though to almost all the darkness seemed to come on in distinct pulsations, which may be due to the varying rate of the dilatation of the pupil, no shadow bands were observed.

E.

Six other observers, one with a 4-inch refractor, another with two cameras (one of which was provided with a large Nicol), and the remaining four with prepared charts, had intended to map the corona in quadrants, to note its structure, and examine it in two rectangular directions for polarisation, but clouds prevented any work of this kind being done.

Two accounts of the eclipse are appended. The words written at the time by T. C. Porter are copied from his notes almost verbatim; the other by E. A. Mason, written out just afterwards from a rough account written during the eclipse.

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* M. Roberts, J. M. Hughes, G. Hutchings, and John Cordeaux. A brief summary of the observations will be found in the table at the end, arranged chronologically. The time throughout is "Continental."

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General Account. By T. C. Porter.

The first contact ($4^h\ 1^m$) was not observed, the sky being overcast with grey stratus cloud, thin overhead, yellowish brown about 45° W. of the Sun, not so deeply coloured the same distance to the E. The point opposite the Sun is yellowish brown. There are a few clear spaces of very light blue sky ($4^h\ 10^m$).

A slight, very small rain falls for a few minutes; patches of sunshine are visible on the hills to the E., which are of a French-blue-mixed-with-white colour. The sky in the W. is gradually clearing, details on the hills to the E. growing clearer ($4^h\ 24^m$).

The light on the horizon to the N.W. grows brighter, but in front, under the Sun (N.E.), it grows rather darker. The clouds near the Sun get darker and more brown, whilst long bluish rifts are drifting slowly from the N.W. towards the N.E. $4^h\ 31^m$).

At $4^h\ 35^m$ the clouds are distinctly growing to the W. of the Sun. Over it is forming a herring-bone arrangement of cumulo stratus. A slight but very distinct breeze from the N.W. sprung up at $4^h\ 37^m$, the lines of cloud under the Sun are becoming more and more defined and heavier-looking, of a slaty-blue near the horizon.

At $4^h\ 40^m$ seven birds flew past towards the south, all calling.

At $4^h\ 45^m$ four birds flew by towards the north. It has grown sensibly colder; wind very faint from the same quarter. Yellowish ochre gleams on the N.N.E. horizon, then two ravens flying north and croaking loudly went by: they separated, one flying round by N. and W.

The blue sky is getting more like indigo, the clouds the same colour, only darker.

Totality seemed to come on in waves of darkness (*vide* footnote in table) just *after* the signal given by the British Astronomical Association, the spaces in the sky where the veil of cloud was very thin turning a sickly yellow ochre colour. There is a dead silence, a brilliant red orange sky on the N. and N.W. horizon, *very* dark indigo and muddy French blue clouds, and

Chronological Summary of Observations on the Total Solar Eclipse of 1896 *August*

Time C. Europ. h m s	Temp. F. °	Wind Direction	Wind Force	Colour of Land West of Sun	Colour of Land East of Sun
3 30 0	45				
3 45 0	44½	N. slightly E.	*Very* light		
4 0 0	44½	,,	,,		
4 1 6		First contact.			
4 10 0		N. slightly W.	*Very* light	Dist. purple; mid. dist. green from vegetation (A)	
4 15 0	45				
4 20 0		N.N.W.	Very light but increasing		
4 25 0	45	N.N.W.	Still increasing		

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just under where the Sun lies hidden, and about 2° above the horizon, a few torn, fleecy clouds, bright silver grey, illuminated intensely on the under surfaces (light reflected from the Sun shining on the sea beyond the path of the Moon's umbra). It was quite easy to read the seconds-hand of my watch, and just possible to read the largest letters of the ordinary Wilson S.S. luggage label on my telescope-box cover, standing seven feet away. It was easy to see one's pencil writing, and would have been easy to draw without any artificial light. The sky in one place where it could be seen was a purple colour. The sea between the island and Vadsö was easily seen, but it was impossible to make out objects clearly where they had the turf, &c., of the island we were on for background. The Moon's shadow was seen passing off to the north-east at the close of totality.

General Account. By E. A. Mason.

I was on the island close to Vadsö, away from the rest of my party, undisturbed, and gave my whole senses to observation. The colour of the sky was neutral tint (at the beginning of the eclipse), the sea very grey, and the land a sombre hue. The light began to fade gradually at first, but when totality began a sudden rush of darkness came. A gentleman who was standing some little way off, and whose figure had stood out against the horizon, became enveloped in it and was lost to view. The darkness cleared off as suddenly as it came on. . . . I had near me all the time a reindeer, four sheep, and six ponies. Till the end of totality they were all lying down, then the sheep and ponies got up at once and began to move about, as if they, like myself, felt relieved from the feeling of intense darkness. The reindeer, which was standing grazing when the eclipse began, lay down as it grew darker, as if night had come, and, unlike the other animals, did not move again. The seabirds kept up a perpetual twittering the whole time. The stars were not visible during the eclipse at all. The metal surface of my knife had drops on it after totality, and, though I did not feel it myself, I believe some rain fell in a misty kind of way.

as seen from Vadsö, Varanger Fjord, by some of the passengers of S.S. *Neptun.*

Sea	Sky		Remarks
	West of Sun	East of Sun	
late and silver greys (A)	Greys		About 4.15 a slight shower of small rain fell (E)

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Time C. Europ. h	m	s	Temp. F. °	Wind Direction	Wind Force	Colour of Land West of Sun	Colour of Land East of Sun
4	30	0		N.N.W.	Light		
4	35	0	45				Dist. indigo blue; fo ground brown a green (C)
4	40	0	44½	N.N.W.	Light		
4	45	0	44				Dist. pale grey blue (mid dist. green a grey (B); foregrou green (B)
4	48	0					
4	50	0	44	N.N.W.	Light and decreasing	Hills in purple shadow as on a clear night (D)	Dist. blackish blue (foreground grey bro (C)
4	51	0					
4	55	0	43½	N.W.	Decreasing		Dist. dull grey blue (
4	56	0		N.W.	Still decreasing		Mid dist. dull green (foreground dull gre (B)
4	56	59		Totality (by calculation)	Stiller, if possible	Dist. hills dark purple (A); foreground yellow green (A)	Dist. hills brown bla (C); mid dist. gre black (C); foregrou lighter green black (
4	57	30		Mid totality.			
4	58	44		End of totality (by calculation)			
4	59	0					Dist. hills indigo (mid dist. green w grey lights (C); fo ground green with g den lights (C)
5	0	0	43½	N.W.	Very light		
5	5	0	44				
5	10	0		N.W.	Very light		
5	12	0					
5	15	0	44½				
5	20	0		N.W.	Very light		
5	30	0	45				
5	35	0		N.W.	Decreased		
5	45	0	45½				
5	56	42		Last contact.			
6	0	0	46	N.	*Very* light, scarcely perceptible		

Observers indicated by the capital letters in brackets:—(A) M. Roberts, observing
G. Hutchings, observing E. of Sun from the island; (D) J. Cordeaux, observing W. of

N.B.—The events on each horizontal line in this table happened at the time marked
throughout the eclipse.

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Sea	Sky		Remarks
	West of Sun	East of Sun	
aden grey (C)		Grey, blue grey, and high lights pale gold (C)	Clouds began to assume the look of parallelism in W.N.W. to N.N.W. (E)
ull grey, part reenish yel- ow (B)		Clouds grey; lights sickly yellow	Much darker. Two ravens crossed the harbour croaking. Oyster catchers on wing calling “peep, peep.”
	Clouds dark grey and faint purple (A); “touched along edges with pink” (D)	Heavy looking snow clouds, a strip of blue sky, high lights pale yellow (B)	Some rain (misty) fell
eyish green B)			
ark grey (C); ickly green B); dark grey nder clouds, right under he horizon leam (A)	Dark blue grey clouds, bright orange yellow rift near horizon (A)	Black grey clouds, high lights golden, bluish grey near horizon (C)	4.57.—The Moon's shadow visible at a great distance, the darkness coming on in rapid and very distinct pulsations or throbs, about 6 a second (D)
	Some torn feathery clouds bright grey and intensely illuminated on under surfaces about 2° above N.N.E. horizon: they were lower than the other clouds (E)	Near the Sun the horizon was yellowish flame-coloured, fading into pale yellow further east (B)	During totality “nothing invisible far or near” (D) No shadow bands observed either before or after totality
	Grey (A)	Dark blue grey (C)	4.59.—Shadow seen retiring like a thunderstorm gloom (E) Rapid return of light (D)
lver grey (C)			
			Linear appearance of cloud quite gone (E)

Sun from the island; (B) J. M. Hughes, observing E. of Sun from the island; (C)
om Vadsö Harbour; (E) T. C. Porter, observing from the island.
e first column on the left; thus it is easy to see the progress of the different phenomena